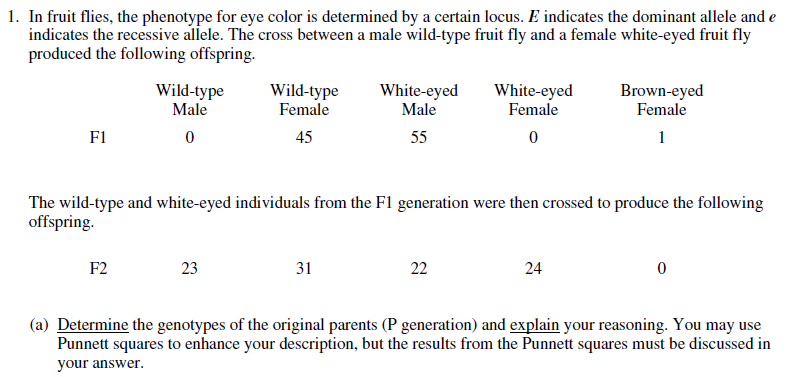
**Practice Long Response: Classical Genetics**

Ms. Ottolini, AP Biology

Note: The following question is from the released 2003 AP Test

***Directions:*** Each answer should be written in paragraph form; an outline or bulleted list alone is not acceptable. Do not spend time restating the questions or providing more than the number of examples called for. For instance, if a question calls for two examples, you can earn credit only for the first two examples that you provide. Labeled diagrams may be used to supplement discussion, but unless specifically called for by the question, a diagram alone will not receive credit.



Note:

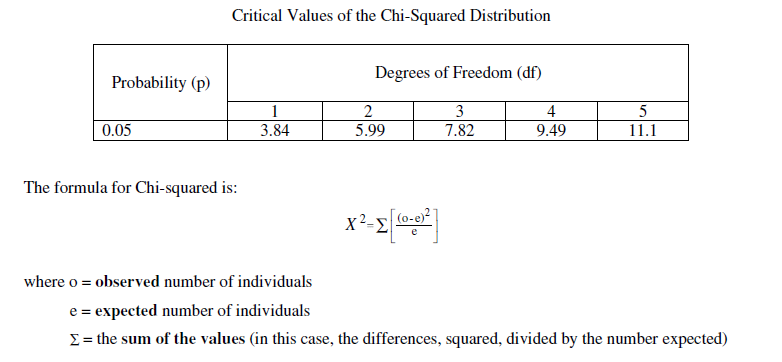
-You need to determine, based on the F1 and F2 data, what type of trait is being displayed (autosomal or sex-linked). This will allow you to define your alleles and determine the parent genotypes

-Wild-type is the dominant trait (E) and white eyes is the recessive trait (e). The alleles, genotypes, and phenotypes for each type of trait (autosomal or sex-linked) are given in the chart below.

-Ignore the brown female in this portion of the question.

|  |  |  |  |
| --- | --- | --- | --- |
| **Type of Trait** | **Alleles** | **Genotypes** | **Phenotypes** |
| Autosomal | E = wild type  e = white | EE | Wild type |
| Ee | Wild type |
| ee | White |
| Sex-Linked | XE = wild type  Xe = white | XE XE | Female, Wild type |
| XE Xe | Female, Wild type |
| Xe Xe | Female, White |
| XE Y | Male, Wild type |
| XeY | Male, White |





Note:

-Your Punnett squares showing your F2 generation will give you your predicted offspring phenotype frequencies. Multiply this frequency by the total number of flies in the F2 observed results to determine your “e” (expected) values for each phenotype.

-Ignore the brown female in this portion of the question.



Note:

-You can discuss specific types of gene mutations OR large chromosomal mutations.